

Polymer Positive Temperature Coefficient MSM(1812) Series

Features

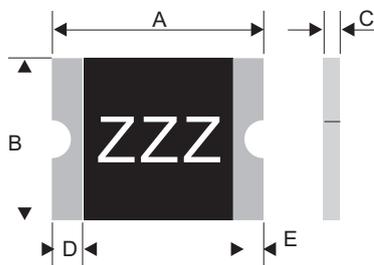
- Surface Mount Devices
- Lead free device
- Size 4532mm/1812mils
- Surface Mount packaging for automated assembly
- Agency Approval:UL、ROHS

Applications

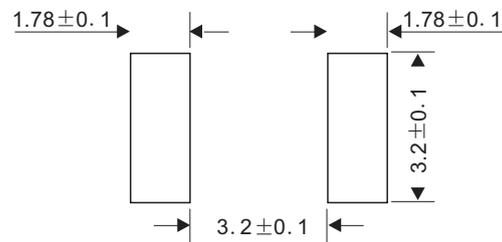
Almost anywhere there is a low voltage power supply, up to DC33V and a load to be protected, including:

- Computer mother board、Modem、USB hub
- PDAs & Charger、Analog & digital line card
- Digital cameras、Disk drivers、CD-ROMs

Dimensions(1812)



Recommended Mounting Pad Layout



Dimensions in millimeters

Part Number	Marking	A		B		C		D	E
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Min.
MSM010/60	JK010	4.37	4.73	3.07	3.41	0.5	1.0	0.3	0.25
MSM014	JK014	4.37	4.73	3.07	3.41	0.5	1.1	0.3	0.25
MSM020/60	JK020	4.37	4.73	3.07	3.41	0.5	1.0	0.3	0.25
MSM030	JK030	4.37	4.73	3.07	3.41	0.5	1.0	0.3	0.25
MSM050	JK050	4.37	4.73	3.07	3.41	0.4	0.9	0.3	0.25
MSM050/24/30	JK050	4.37	4.73	3.07	3.41	0.4	1.1	0.3	0.25
MSM075/16/24	JK075	4.37	4.73	3.07	3.41	0.4	0.9	0.3	0.25
MSM075/33	JK075	4.37	4.73	3.07	3.41	0.5	1.2	0.3	0.25
MSM110/16	JK110	4.37	4.73	3.07	3.41	0.4	0.9	0.3	0.25
MSM110/24	JK110	4.37	4.73	3.07	3.41	0.4	1.3	0.3	0.25
MSM110/33	JK110	4.37	4.73	3.07	3.41	0.6	1.5	0.3	0.25
MSM125	JK125	4.37	4.73	3.07	3.41	0.3	1.3	0.3	0.25
MSM150/16	JK150	4.37	4.73	3.07	3.41	0.3	1.2	0.3	0.25
MSM150/24	JK150	4.37	4.73	3.07	3.41	0.6	1.5	0.3	0.25
MSM150/30	JK150	4.37	4.73	3.07	3.41	0.8	1.5	0.3	0.25
MSM160	JK160	4.37	4.73	3.07	3.41	0.3	0.8	0.3	0.25
MSM200	JK200	4.37	4.73	3.07	3.41	0.3	1.3	0.3	0.25
MSM200/12	JK200	4.37	4.73	3.07	3.41	0.6	1.4	0.3	0.25
MSM200/16	JK200	4.37	4.73	3.07	3.41	0.6	1.4	0.3	0.25
MSM200/24	JK200	4.37	4.73	3.07	3.41	0.6	1.5	0.3	0.25
MSM260	JK260	4.37	4.73	3.07	3.41	0.6	1.6	0.3	0.25
MSM260/16	JK260	4.37	4.73	3.07	3.41	0.6	1.8	0.3	0.25
MSM300/6	JK300	4.37	4.73	3.07	3.41	0.5	1.5	0.3	0.25
MSM300/16	JK300	4.37	4.73	3.07	3.41	0.5	1.5	0.3	0.25

Electrical Characteristics(25°C)

Part Number	I _{hold} (A)	I _{trip} (A)	V _{max.} (Vdc)	I _{max.} (A)	P _{d typ.} (W)	Maximum Time To Trip		Resistance	
						Current (A)	Time (Sec.)	R _{min} (Ω)	R _{1max.} (Ω)
MSM010	0.10	0.30	30	100	0.8	0.5	1.50	0.75	15.00
MSM010/60	0.10	0.30	60	40	0.8	0.5	1.50	0.75	15.00
MSM014	0.14	0.34	60	100	0.8	1.5	0.15	0.65	6.00
MSM020	0.20	0.40	30	100	0.8	8	0.02	0.35	5.00
MSM020/60	0.20	0.40	60	100	0.8	8	0.02	0.35	5.00
MSM030	0.30	0.60	30	100	0.8	8	0.10	0.25	3.00
MSM050	0.50	1.00	15	100	0.8	8	0.15	0.15	1.00
MSM050/24	0.50	1.00	24	100	0.8	8	0.15	0.15	1.00
MSM050/30	0.50	1.00	30	100	0.8	8	0.15	0.15	1.00
MSM075	0.75	1.50	13.2	100	0.8	8	0.20	0.09	0.45
MSM075/16	0.75	1.50	16	100	0.8	8	0.20	0.09	0.45
MSM075/24	0.75	1.50	24	100	0.8	8	0.20	0.09	0.45
MSM075/33	0.75	1.50	33	100	0.8	8	0.20	0.09	0.45
MSM110	1.10	2.20	8	100	0.8	8	0.30	0.05	0.25
MSM110/16	1.10	2.20	16	100	0.8	8	0.30	0.05	0.25
MSM110/24	1.10	2.20	24	100	0.8	8	0.30	0.05	0.25
MSM110/33	1.10	2.20	33	100	0.8	8	0.30	0.05	0.28
MSM125	1.25	2.50	16	100	0.8	8	0.40	0.05	0.16
MSM150/16	1.50	3.00	16	100	0.8	8	0.50	0.04	0.16
MSM150/24	1.50	3.00	24	100	0.8	8	0.50	0.04	0.16
MSM150/30	1.50	3.00	30	40	0.8	8	0.50	0.04	0.18
MSM160	1.60	2.80	8	100	0.8	8	1.00	0.03	0.13
MSM200	2.00	4.00	8	100	0.8	8	2.00	0.02	0.10
MSM200/12	2.00	4.00	12	100	0.8	8	2.00	0.02	0.10
MSM200/16	2.00	4.00	16	100	0.8	8	2.00	0.02	0.10
MSM200/24	2.00	4.00	24	40	0.8	8	2.00	0.02	0.10
MSM260	2.60	5.00	8	100	0.8	8	2.50	0.015	0.05
MSM260/16	2.60	5.00	16	100	0.8	8	2.50	0.015	0.06
MSM300/6	3.00	5.00	6	100	0.8	8	4.00	0.012	0.04
MSM300/16	3.00	5.00	16	100	0.8	8	4.00	0.012	0.04

Notes :

I_{hold} = Hold Current. Maximum current device will not trip in 25°C still air.

I_{trip} = Trip Current. Minimum current at which the device will always trip in 25°C still air.

V_{max} = Maximum operating voltage device can withstand without damage at rated current (I_{max}).

I_{max} = Maximum fault current device can withstand without damage at rated voltage (V_{max}).

P_d = Power dissipation when device is in the tripped state in 25°C still air environment at rated voltage.

R_{min} = Minimum device resistance prior to tripping at 25°C.

R_{1max} = Maximum device resistance is measured one hour post reflow.

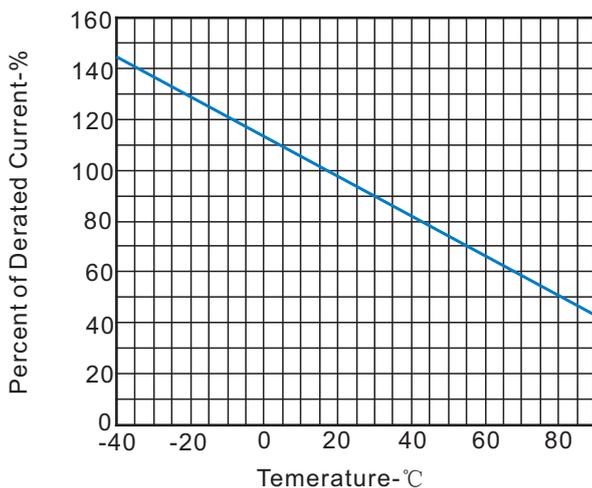
CAUTION : Operation beyond the specified ratings may result in damage and possible arcing and flame.

Thermal Derating Chart-I_{hold}(A)

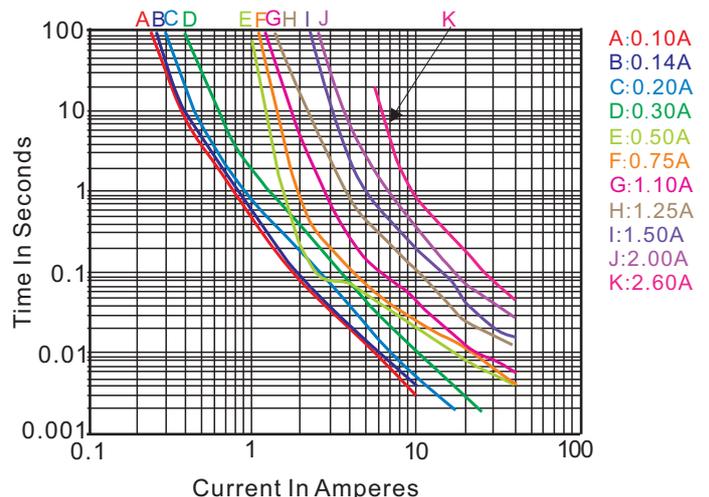
Maximum ambient operating temperature (T _{mao})vs.hold current (I _{hold})									
Part Number	-40°C	-20°C	0°C	25°C	40°C	50°C	60°C	70°C	85°C
MSM010	0.16	0.14	0.12	0.1	0.08	0.07	0.06	0.05	0.03
MSM010/60	0.16	0.14	0.12	0.1	0.08	0.07	0.06	0.05	0.03
MSM014	0.23	0.19	0.17	0.14	0.12	0.1	0.09	0.08	0.06
MSM020	0.29	0.26	0.23	0.2	0.17	0.15	0.14	0.12	0.1
MSM020/60	0.29	0.26	0.23	0.2	0.17	0.15	0.14	0.12	0.1
MSM030	0.44	0.39	0.35	0.3	0.26	0.23	0.21	0.18	0.15
MSM050	0.59	0.57	0.55	0.5	0.45	0.43	0.35	0.3	0.23
MSM050/24	0.59	0.57	0.55	0.5	0.45	0.43	0.35	0.3	0.23
MSM050/30	0.59	0.57	0.55	0.5	0.45	0.43	0.35	0.3	0.23
MSM075	1.1	0.99	0.87	0.75	0.63	0.57	0.49	0.45	0.35
MSM075/16	1.1	0.99	0.87	0.75	0.63	0.57	0.49	0.45	0.35
MSM075/24	1.1	0.99	0.87	0.75	0.63	0.57	0.49	0.45	0.35
MSM075/33	1.1	0.99	0.87	0.75	0.63	0.57	0.49	0.45	0.35
MSM110	1.6	1.45	1.28	1.1	0.92	0.83	0.71	0.66	0.52
MSM110/16	1.6	1.45	1.28	1.1	0.92	0.83	0.71	0.66	0.52
MSM110/24	1.6	1.45	1.28	1.1	0.92	0.83	0.71	0.66	0.52
MSM110/33	1.6	1.45	1.28	1.1	0.92	0.83	0.71	0.66	0.52
MSM125	2	1.75	1.52	1.25	1	0.95	0.9	0.75	0.53
MSM150/16	2.3	2.05	1.77	1.5	1.23	1.09	0.95	0.82	0.61
MSM150/24	2.3	2.05	1.77	1.5	1.23	1.09	0.95	0.82	0.61
MSM150/30	2.3	2.05	1.77	1.5	1.23	1.09	0.95	0.82	0.61
MSM160	2.45	2.15	1.89	1.6	1.34	1.25	1.15	0.96	0.79
MSM200	2.89	2.61	2.35	2	1.75	1.55	1.45	1.3	1.1
MSM200/12	2.89	2.61	2.35	2	1.75	1.55	1.45	1.3	1.1
MSM200/16	2.89	2.61	2.35	2	1.75	1.55	1.45	1.3	1.1
MSM200/24	2.89	2.61	2.35	2	1.75	1.55	1.45	1.3	1.1
MSM260	3.8	3.61	3.12	2.6	2.28	2.1	1.85	1.61	1.29
MSM260/16	3.8	3.61	3.12	2.6	2.28	2.1	1.85	1.61	1.29
MSM300/6	4.34	3.92	3.45	3	2.63	2.49	2.18	2.09	1.79
MSM300/16	4.34	3.92	3.45	3	2.63	2.49	2.18	2.09	1.79

Characteristic Curve

Thermal Derating Curve



Typical Time To Trip At 25°C



Environmental Specifications

Test	Conditions	Resistance Change
Passive aging	+85°C, 1000 hrs.	±5% typical
Humidity aging	+85°C, 85% R.H. , 168 hours	±5% typical
Thermal shock	+85°C to -40°C, 20 times	±33% typical
Resistance to solvent	MIL-STD-202, Method 215	No change
Vibration	MIL-STD-202, Method 201	No change
Ambient operating conditions : - 40 °C to +85 °C		
Maximum surface temperature of the device in the tripped state is 125 °C		

Termination Pad Characteristics

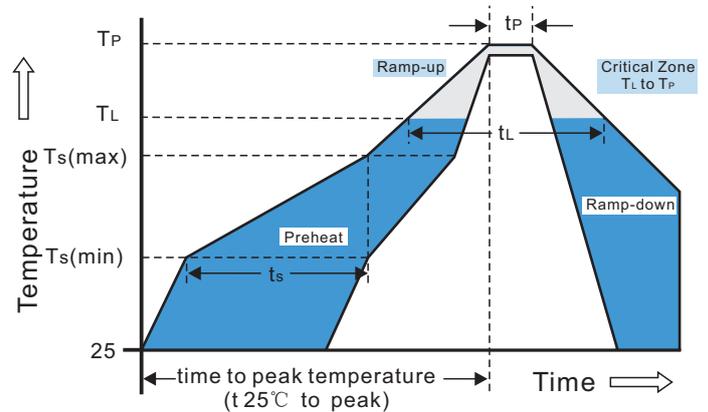
Terminal pad materials	Tin-Plated Nickle-Copper or Gold-Plated Nickle-Copper
Terminal pad solderability	Meets EIA specification RS186-9E and ANSI/J-STD-002 Category 3.

Recommended Soldering Conditions

Recommended Conditions

Profile Feature		Pb-Free assembly
Pre Heat	-Temperature Min($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time(Min to Max)(t_s)	60-180seconds
Average ramp up rate ($T_{s(max)}$ to T_p)		3°C/second Max.
Time maintained above:	-Temperature(T_L)	+217°C
	-Time(t_L)	60-150seconds
Peak Temp(T_p)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp(t_p)		20-40seconds
Ramp-down Rate		6°C/second Max.
Time 25°C to Peak Temp(T_p)		8 minutes Max.

Reflow Soldering



- Recommended reflow methods: IR, vapor phase oven, hot air oven, N₂ environment for lead-free.
- Devices are not designed to be wave soldered to the bottom side of the board.
- Recommended maximum paste thickness is 0.25mm (0.010inch).
- Devices can be cleaned using standard industry methods and solvents.

Notes:

If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

Packageing Information

Part Number	Packaging Option	Quantity
MSM010-030, MSM075/33, MSM110/24-150/24, MSM200-300/16	Reel	1500pcs/reel
MSM050 ~ 075/24, MSM110~110/16, MSM160	Reel	2000pcs/reel